REMARKS

I. CLAIM STATUS AND INITIAL REMARKS

Before this amendment, claims 44-89 were pending. By this amendment, claims 44 and 77 were amended to recite the limitation of claim 47, i.e., the "crosslinked elastomeric composition [has] a dynamic elastic modulus (E') at 23° C that is greater than or equal to 15 MPa and less than or equal to 20 MPa." Hence, claims 46 and 47 were cancelled without prejudice or disclaimer. The amended claims have Section 112 support and thus, no new matter has been added. Claims 44, 45, and 48-89 are pending for examination on their merits.

II. RESPONSE TO CLAIM REJECTIONS

A. 35 U.S.C. § 103(a) Rejection of Claims 44-78 and 81-89

The Office rejects claims 44-78 and 81-89 under 35 U.S.C. § 103(a) as being allegedly unpatentable over a U.S. Patent No. 6,858,665 to Larson et al. (hereafter, "Larson") in view of European Patent Application No. EP 0 341 187 to Dill et al. (hereafter, "Dill") and U.S. Patent No. 6,516,847 to Amaddeo et al. (hereafter, "Amaddeo") for the reasons specified on pages 2-5 of the Office Action. Applicants respectfully disagree with and traverses this rejection for at least the following reasons.

The Office bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. *See* M.P.E.P. § 2142. In *KSR Int'l Co. v. Teleflex Inc.*, 82 U.S.P.Q.2d 1385, 1388 (2007), the Supreme Court confirmed that the "framework for applying the statutory language of §103" is still based on its landmark decision in *Graham v. John Deere Co. of Kansas City*, 148 U.S.P.Q. 459 (1966). Under *Graham*,

four factors must be considered when determining whether an invention is obvious: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art; and (4) secondary considerations. 148 U.S.P.Q. at 467. The obviousness or non-obviousness of the claimed invention is then evaluated in view of the results of these inquiries. *See Graham*, 148 U.S.P.Q. 467; *see also KSR*, 82 U.S.P.Q. 2d at 1388. Implicit in this analysis is the requirement that the Office show that each and every element of the rejected claims is disclosed in the prior art. M.P.E.P. § 2143.03.

In the instant case, the Office has not established a prima facie case of obviousness, at least because none of the references relied on by the Office teach or suggest a tyre for a vehicle wheel:

> . . . wherein the tread band comprises:
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> a radially outer layer designed to contact the ground; and
>
> a radially inner layer between the belt structure and the radially outer layer;
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> wherein the radially inner layer comprises a crosslinked elastomeric composition having a dynamic elastic modulus (E') at 23° C that is greater than or equal to 15 MPa and less than or equal to 20 MPa, and
>
> wherein the elastomeric composition comprises: at least one diene elastomeric polymer; and at least one layered inorganic material. . .

Claim 44. Nor do the references relied on by the Office teach or suggest each and every element of independent method claim 77, which recites, *inter alia*:

> [a] process for producing a tyre . . . comprising:
>
> manufacturing the tyre by assembling . . . a tread band . . . wherein the tread band comprises: a radially outer layer . . . and a radially inner layer . . . wherein the radially inner layer comprises a crosslinkable elastomeric composition having a dynamic elastic

> modulus (E') at 23° C that is greater than or equal to 15 MPa and less than or equal to 20 MPa, and
>
> wherein the elastomeric composition comprises: at least one diene elastomeric polymer; and at least one layered inorganic material. . .
> .

1. Prior Art Does Not Teach All Claim Limitations

Larson discloses a "process of preparing a rubber composition which contains a dispersion of intercalated and at least partially exfoliated clay . . . ." Larson, column 3, lines 52-55. In Table 2 in columns 10 and 11, Larson describes the physical properties of several rubber compositions in accordance with its disclosure. In particular, Larson discloses G' (storage modulus) and tan δ (ratio of loss modulus : storage modulus, i.e., hysteresis) at column 10, line 64 to column 11, line 12, measured at 1% and 10% strain and 100 °C.

Larson indicates that the purpose of the disclosed layered material is to reinforce rubber, and that the reinforced rubber is suitable for forming at least one component of a tire, such as a tread. *See id* at column 2, lines 64-67 and column 5, lines 43-51. However, Larson does not disclose a tyre (or a process for producing a tyre) comprising a tread band, wherein the tread comprises a radially outer layer (i.e., tread) and a radially inner layer, wherein the radially inner layer comprises a crosslinkable elastomeric composition having a dynamic elastic modulus (E') at 23° C that is greater than or equal to 15 MPa and less than or equal to 20 MPa, as claimed. *See* claims 44 and 77. This fact is admitted by the Office. *See* Office Action, page 2 ("Larson is silent as to the tread having a cap base construction.").

Moreover, Larson does not teach or suggest that its compositions may attain the claimed E' range of greater than or equal to 15 MPa and less than or equal to 20 MPa.

Rather, even at 1% strain, Larson discloses examples with a G' (the comparable variable to E') no higher than 8.6 MPa. Larson at column 10, line 65. Larson does not even recognize G' as a result-effective variable. In order for a variable to be considered result effective, and thus one that may be obvious to modify, it is not enough for a reference to recognize the existence of the variable; rather the reference must recognize that ***manipulating*** the variable "achieves a recognized result." M.P.E.P. § 2144.05 (II)(B). Here, unlike temperature and pressure, E' or G' are not recognized by Larson as a variable to be adjusted to some end.

Dill does not cure the deficiencies of Larson described above. Dill discloses tread bands having a hard cap (radially outer layer) and soft base (radially inner layer) structure. *See* Dill, column 2, lines 17-26, column 4, lines 22-23. While Dill discloses that the cap and base may be formulated so as to exhibit different properties, it does not teach or suggest the crosslinked elastomeric composition recited in claims 44 and 77, let alone the inclusion of a crosslinked elastomeric composition with the composition recited in claims 44 and 77 in the radially inner (base) layer of a tire tread, as recited in claims 44 and 77.

Amaddeo also does not cure the deficiencies of Larson, discussed above. Amaddeo describes tire tread bands having radially inner and outer layers. *See* Amaddeo, column 2, lines 28-37. In addition, Amaddeo indicates that the performance and comfort of a tread band may be balanced by adjusting certain properties of the radially inner and outer layers to within particular values. *See id.* at column 2, lines 39--50 and column 3, lines 1-18. Like Dill and Larson, however, Amaddeo is silent with respect to the crosslinked elastomeric composition recited in claims 44 and 77, as well

as the inclusion of a crosslinked elastomeric composition n the radially inner layer of a tread band, as recited in claims 44 and 77. Indeed, Amaddeo appears to be silent with respect to any crosslinked elastomeric composition comprising a diene and layered inorganic material. Thus, Amaddeo reinforces Dill's suggestion of rubber materials outside the scope of the pending claims for use as the inner layer of a tire tread having a cap/base construction.

For at least the foregoing reasons, Applicants submit that Larson, Dill, and Amaddeo, whether considered alone or in combination, fail to teach or suggest each and every element of independent claims 44 and 77, much less dependent claims 45, 48-76, 78, and 81-89.

2. Prior Art Provides No Motivation For Proposed Combination

Larson, Dill, and Amaddeo provide no information explaining *why* one of ordinary skill in the art would modify or combine their respective disclosures in an attempt to arrive at the claimed invention. In this regard, Applicants acknowledge the Office's argument that one of ordinary skill in the art would have found it obvious to add a cap/base construction described in Dill to Larson's tread band, and utilizing Larson's composition in a base having the properties of Amaddeo's base. *See* Office Action, pages 2 and 3. Although not clearly articulated, the Office's position appears to be based on the fact that Amaddeo describes certain desirable properties for the inner layer of its disclosed tread band, and that Larson's rubber compositions are disclosed to exhibit at least some of these properties. *See id.; see also* Amaddeo, column 3, lines 1-18 and Larson, column 10, line 65 to column 11, line 11. Applicants respectfully disagree with the Office's position.

First, contrary to the Office's argument (Office Action at 3), Dill does not provide a motivation to utilize a cap and base construction, such as Amaddeo's, in Larson. While both Dill and Amaddeo disclose cap/base constructions, they are diametrically opposed structures. Whereas Dill (and its alleged advantages) are directed to (and come from) a cap/base construction where the base is softer than the cap (column 4, lines 22-35), Amaddeo is directed to a cap/base construction where the base is harder than the cap (column 2, lines 32-37).[1] Hence, to the extent Dill provides any motivation to modify Larson (and Applicants do not agree that it does), it is only for Dill's construction and not Amaddeo's. Further, as noted by the Office, Amaddeo appears to provide benefits over other cap/base tyres, but does not appear to teach a benefit over tyres that do not have a cap/base structure. Amaddeo at column 1, lines 47-65.

Second, neither Larson, Dill, nor Amaddeo provide any information supporting a conclusion that one of ordinary skill would see any reason to specifically select Larson's compositions to be an inner tread layer. Indeed, Larson provides no information suggesting the use of its rubber compositions in the inner layer of a tire tread having a cap/base construction. Rather, since Larson only discloses the general concept of treads, one of ordinary skill would reasonably conclude that Larson's disclosure only applies to the cap of the cap/base construction, since it is the cap which functions as a tread. Further, Dill and Amaddeo only identify rubber compositions that *do not contain inorganic layered material* exhibit ***their*** desired properties. *See* Dill ay columns 4-5, Amaddeo at column 3, line 65 to column 4, line 5.

[1] While Amaddeo does not expressly discuss hardness values, as does Dill, a person skilled in the art would readily recognize that Amaddeo's required ratios for E' and tan δ dictate that the base is harder than the cap.

Third, inasmuch as the Office's position is predicated on a belief that Larson's compositions meet the specific property relationships identified in Amaddeo, Applicants disagree. Amaddeo indicates that the modulus of elasticity (E') and hysteresis (tan δ) of the cap and base layers of a tire tread having a cap/base construction should be controlled such that the ratio of the value of the corresponding property (E' or tan δ) of the inner layer to the property of the outer layer falls within a defined range. *See* Amaddeo, column 2, lines 50-60. In particular, Amaddeo states that:

> to achieve the best possible compromise between rolling resistance, handling and comfort of the tire, it is necessary that: i) the ratio between the . . . [E'] measured at 70 °C of the radially inner layer and the corresponding value of the radially outer layer be comprised between 1.1 and 3, and that ii) the ratio between the value of . . . [tan] δ at 70°C. [sic] of the radially inner layer and the corresponding value of the radially outer layer be lower than 0.8.

Id. at column 2, lines 54-60. Hence, to achieve the alleged benefits of Amaddeo, the Office must provide some basis for concluding that the proposed combination would meet these ratios. Yet the Office has not.

Fourth, the Office's premise that Larson's compositions meet the specific property relationships identified in Amaddeo is not based in fact. While Amaddeo teaches that its base or radially inner layer exhibits an E' at 70 °C between 5 and 14 MPa, its cap or radially outer layer exhibits an E' at 70 °C between 4 and 8 MPa. Amaddeo at column 3, lines 14-18. We understand that this is measured at a strain of 25%. *Id.* at column 12, lines 43-49. In contrast, Larson's comparable G' is measured at 100 °C and either 1% or 10% strain. Larson at column 10, line 65 - column 11, line 7. Thus, the most applicable G' values (10% strain) of Larson range between 2.6 and 4.2 MPa, which are ***below*** Amaddeo's 5 and 14 MPa for the ***inner*** layer, yet ***overlap***

Amaddeo's 4 and 8 MPa for the ***outer*** layer. Further, Larson teaches that the difference in strain should be significant, since going from 1% to 10% reduces the G' values by half. Larson at column 10, line 65 to column 11, line 7. Thus, the reported G' values in Larson would be significantly lower if measured under the 25% strain used by Amaddeo. Accordingly, Larson's data establishes that at best its composition is suitable for Amaddeo's outer layer, but not the inner layer. At worst, it establishes that its compositions are altogether not suitable for Amaddeo's cap/base tread. Consequently, there is no motivation to reach the claimed combination.

Fifth, in view of the above discussion, there is no basis for one skilled in the art to modify Larson to obtain Applicants' E' range of greater than or equal to 15 MPa and less than or equal to 20 MPa. Larson discloses values no greater than 8.6 MPa and Amaddeo recommends values of 14 MPa and below.

Thus, the burden remains on the Office to provide a tenable rationale explaining *why* one of ordinary skill would see any reason to modify or combine Larson, Dill, and Amaddeo in an attempt to arrive at the claimed invention. As the Office has failed to meet this burden, the 35 U.S.C. § 103(a) rejection of claims 44, 45, 48-78 and 81-89 is improper, and should be withdrawn.

B. 35 U.S.C. § 103(a) Rejection of Claims 79 and 80

The Office rejects claims 79 and 80 under 35 U.S.C. § 103(a) as being allegedly unpatentable over the combination of Larson, Dill, and Amaddeo addressed above, further in view of U.S. Pre-grant Publication No. 2002/0007893 to Koyama et al. (hereafter, "Koyama"), and U.S. Patent No. 6,039,826 to Okada (hereafter, "Okada").

Koyama and Okada fail to correct the deficiencies of Larson, Dill, and Amaddeo described above with respect to claim 77, from which claims 79 and 80 depend. That is, while Koyama and Okada may or may not disclose other aspects of the claimed invention, at a minimum they fail to teach or suggest a tire (or a method for making a tire) comprising a tread band having radially inner and outer layers, wherein the radially inner layer comprises a crosslinked elastomeric composition having a dynamic elastic modulus (E') at 23° C that is greater than or equal to 15 MPa and less than or equal to 20 MPa, and comprising at least one diene and at least one inorganic layered material, as recited in independent claim 77.

For at least these reasons, Larson, Dill, Amaddeo, Koyama, and Okada fail to teach or suggest each and every element of the pending claims, whether considered alone or in combination. Applicant therefore submits that the 35 U.S.C. § 103(a) rejection of claims 79 and 80 as being unpatentable over Larson, Dill, Amaddeo, Koyama, and Okada is improper, and should be withdrawn.

III. Conclusion

In view of the foregoing amendment and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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